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*College of Agriculture*

# **NORDAN-**

# **Crested Wheatgrass for Idaho**

**Ronald B. Foster and Hugh McKay**

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## NORDAN Crested Wheatgrass For Idaho<sup>1</sup>

Ronald B. Foster and Hugh McKay<sup>2</sup>

*Agropyron desertorum*, commonly referred to as crested wheatgrass, is a long-lived, drought-tolerant bunchgrass, native to the rocky steep slopes and dry meadows of Mongolia, Djungaria-Kashgaria, and Tibet. Collections have also been made on the chernozem soils of the cold, dry plains of Russia. The first collections were introduced into North America in 1898 by the U.S. Department of Agriculture. Not until the early 1930's were its values fully recognized and its phenomenal spread as a range reseeding grass began. The species is particularly well adapted to the semi-arid areas of the western United States and has been extensively seeded in this general area.

Nordan is an improved variety of crested wheatgrass selected by personnel of the Northern Great Plains Agricultural Research Service Field Station at Mandan, North Dakota. The original plant selections were made from plots of crested wheatgrass which had been growing in an old nursery for many years. These selections were tested extensively and the variety NORDAN released from this selection program in 1953 by the North Dakota Agricultural Experiment Station and the Crops Research Division of the USDA Agricultural Research Service. Since Nordan's release it has been tested extensively throughout the west and is recommended and certified by most western states.

<sup>1</sup> This publication resulted from the combined efforts of the Aberdeen Plant Materials Center, Soil Conservation Service, and the Tetonia Branch Experiment Station of the University of Idaho Agricultural Experiment Station. These activities are documented

Manager of the Aberdeen Plant Materials Center, U.S. Department of Agriculture, Soil Conservation Service; and Superintendent of the Tetonia Branch Experiment Station, University of Idaho Agricultural Experiment Station, respectively.

## Adaptation and Use

Nordan is adapted to conditions wherever commercial crested wheatgrass has been successfully seeded. In the west these are generally the areas that have winter snow, spring and fall rains, and hot, dry summers. It makes excellent spring and fall pasture under these conditions. Because of its early spring growth habit, Nordan also makes good early spring pasture in higher precipitation areas even where other grass species are adapted. Nordan heads at about the same time as regular crested wheatgrass and completes its growth cycle so it becomes dormant during the hot, dry season. This characteristic makes it possible for the plants to persist under adverse summer moisture conditions for many years producing usable forage each spring and fall.

The above described characteristics of Nordan also make it an excellent grass for soil protection. Its ground cover effectively reduces wind and water erosion.

## Advantages of the NORDAN Variety

A principal advantage of Nordan is the uniformity of its plants. The plants are more uniform in appearance with a higher proportion of leaves to stems than is found in most commercial crested wheatgrass strains. Seed heads are essentially beardless which makes them more readily acceptable to grazing animals than the sharply bearded heads of commercial crested. Nordan has exceptionally good seedling vigor and stand establishment has been rapid and uniform in trials.

Nordan has been equal to or higher in total forage production than regular commercial crested wheatgrass strains in many trials conducted in the west.

Nordan has a known origin, and plantings made from certified seed can be depended upon to be consistently the same regardless of the year in which the seed is produced or planted. Commercial crested wheatgrass plants established with seed from different sources exhibit a wide range of plant types. Many plants developing from these seed lots have a high proportion of stems to leaves which reduces the percentage of usable forage.

## Culture

Nordan does best when drilled into a firm, weed-free seedbed. Late fall seedings are best in areas of low annual precipitation. The seed does not decay during the winter, and germination takes place early the next spring so that seedlings can become established before the moisture supply is gone. The safe fall-seeding date varies across the state. For this reason, growers will be wise to check with local agricultural agents or Soil Conservation Service technicians for their particular areas.

Early spring seedings are usually best in areas with higher annual precipitation. Advantages to spring seedings are: better weed control through spring seedbed preparation; less soil crusting occurs to hinder seedling emergence; and, in general, more uniform stands are established throughout the various soil types in any field.

Grass seed is always best when drilled to a shallow depth of not more than 1 inch and without a companion crop.

## Seedling Vigor

Establishment or failure of a grass seeding frequently depends upon weather conditions during the first few weeks of spring. Use of a grass variety able to develop a root system during these few critical weeks often means the difference between the planting's success or failure.

Seedling vigor and seed size were some of the criteria for which Nordan was selected. Research results in the west have indicated that Nordan exhibits better seedling vigor than most other varieties and seed lots of commercial crested wheatgrass.

Table 1 presents information collected at different locations in southern Idaho and emphasizing the importance of strong seedling vigor in establishment of satisfactory stands in reseeded areas.

**Table 1. Established seedling counts in nurseries at several southern Idaho locations.**

| Variety and/or species        | L o c a t i o n                                       |           |            |        |    |
|-------------------------------|-------------------------------------------------------|-----------|------------|--------|----|
|                               | Bliss                                                 | Shoshone* | Raft River | Emmett |    |
|                               |                                                       |           | Seeded     | Seeded |    |
|                               |                                                       |           | Oct.       | April  |    |
|                               | Average number of seedlings per 16 linear feet of row |           |            |        |    |
| Nordan crested wheatgrass     | 64                                                    | 1         | 50         | 7      | 27 |
| Commercial crested wheatgrass | 31                                                    | 4         | 65         | 2      | 0  |
| Summit crested wheatgrass     | 64                                                    | 4         | —          | —      | —  |
| Siberian wheatgrass P-27      | 31                                                    | 2         | 69         | 3      | 4  |
| Topar wheatgrass              | 18                                                    | 2         | —          | —      | 0  |
| Sodar wheatgrass              | 10                                                    | 0.3       | 18         | 7      | —  |
| Russian wildrye               | 1                                                     | 0.8       | 16         | 8      | —  |

\* Fall Seeded heavy ground crust the following spring

## Forage Production

Tables 2 and 3 give specific forage yield data from two trials conducted at the University of Idaho Tetonia Branch Experiment Station. No significant differences in forage yields between Nordan and the other grasses alone appear in table 2. For some unexplained reason, Nordan yield was low in the fifth harvest year. It equalled or excelled the other entries in the other five harvests. Uniformity and quality are not evaluated in the tables but should become important in a decision as to which variety to seed. Nordan exhibits definite advantages in these categories.



**Table 2. Forage yield data from a crested-type wheatgrass variety trial planted at the Tetonia Branch Experiment Station in 1952.**

| Variety                                         | Harvest Year                 |     |     |      |      |     | Yield Ave/Year |
|-------------------------------------------------|------------------------------|-----|-----|------|------|-----|----------------|
|                                                 | 1                            | 2   | 3   | 4    | 5    | 6   |                |
|                                                 | Air-dry forage—tons per acre |     |     |      |      |     |                |
| Nordan crested                                  | 1.56                         | .94 | .66 | .43  | .72  | .57 | .81            |
| Commercial crested alone                        | 1.60                         | .83 | .69 | .38  | 1.18 | .56 | .87            |
| Average of 8 additional tyw strains alone       | 1.54                         | .76 | .61 | .41  | 1.15 | .57 | .84            |
| Nordan crested and alfalfa*                     | —                            | —   | .85 | .98  | 1.57 | —   | 1.13           |
| Commercial crested and alfalfa*                 | —                            | —   | .81 | 1.06 | 2.01 | —   | 1.29           |
| Average of 6 other" crested-strains and alfalfa | —                            | —   | .86 | 1.01 | 1.80 | —   | 1.22           |

\* Mixture plots not harvested first two or the final harvest year.

The grass-and-alfalfa averages are higher than the grass-alone averages, but no significant difference among the three alfalfa-grass-mixture averages appear. These three years' data on the mixtures are included in the table to emphasize the value of a legume with grass from the standpoint of total forage production. Nitrogen contributed by the legume also improves food value of the forage for the grazing animals.

Nordan was significantly higher in forage production in the second nursery for a 5-year period and, excelled in forage production in the individual years as reported in table 3. Observations and results in field plantings under actual farm conditions substantiate the superior characteristics of the Nordan variety as expressed in experimental plots.

**Table 3. Forage yield data from a crested-type wheatgrass variety trial Planted at the Tetonia Branch Experiment Station in 1955.**

| Variety                                    | Harvest Year                 |      |      |      |      | Yield Ave/Year |
|--------------------------------------------|------------------------------|------|------|------|------|----------------|
|                                            | 1                            | 2    | 3    | 4    | 5    |                |
|                                            | Air-dry forage—tons per acre |      |      |      |      |                |
| Nordan crested                             | 1.30                         | 2.18 | 1.90 | 1.36 | 1.64 | 1.68           |
| Commercial crested                         | 1.28                         | 2.00 | 1.02 | .64  | 1.01 | 1.19           |
| Average of 8 additional strains of crested | .72                          | 1.78 | 1.29 | .77  | 1.08 | 1.13           |

## Grazing Management

Crested wheatgrass withstands heavy grazing better than many other grass species and Nordan is not different in this category. It gives good response by increasing forage production. Because crested-type wheatgrasses are often some of the first to green, up in the spring, they often receive excessive early spring grazing. Total season forage yield is increased if the plants are allowed to reach grazing readiness before they are pastured.

Nordan produces well under a program of deferred-rotation grazing. Different seasons of use in grazing rotation allow the

plants to complete their growth cycle periodically, rebuild root systems, and renew root reserves of plant food. With proper grazing management, a stand of Nordan will persist and produce good forage yields for many years.



## Seed Production

Only limited data on seed production of Nordan crested wheatgrass in Idaho are available. Table 4 contains data from the Tetonia Branch Experiment Station and estimated yields that can be expected in subsequent years. Figures in parentheses are based on farmers' reports of actual seed yields obtained under dryland conditions in Idaho.

**Table 4. Yields from plots of a dryland seed-production trial planted at the Tetonia Branch Experiment Station in 1958.**

| Variety                                 | Harvest Year               |     |     |         |       |
|-----------------------------------------|----------------------------|-----|-----|---------|-------|
|                                         | 1                          | 2   | 3   | 4       | 5     |
|                                         | pounds per acre—clean seed |     |     |         |       |
| Nordan crested                          | 716**                      | 439 | 247 | (200)** | (175) |
| Commercial crested                      | 484                        | 532 | 373 | (303)   | (200) |
| Average of 3 other crested-type strains | 545                        | 383 | 210 | (200)   | (175) |

\* 30 pounds per acre of nitrogen applied.

\*\* Actual yields from large acreage may be lower than these plot yields.

( ) Estimated from actual dryland seed-field yields in Idaho.

High quality seed is also grown under irrigation in southern Idaho. Yields have ranged from 600 to 1000 pounds of clean seed per acre under irrigation for each of the first 3 harvest years. Yields decrease materially after the first 3 or 4 harvest years, but commercial fertilizer stimulates seed production and prevents drastic reductions in seed yields.



Adequate certified seed is available from seed dealers for those interested in seeding this improved grass variety.

To establish seed production fields, foundation and registered seed is produced at the Tetonia Branch Experiment Station for sale within the state. County agents or the Idaho Crop Improvement Association will inspect and certify seed for Idaho farmer growers. Check their booklet for rules and regulations before planting a field for seed production.

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